

Appl. No. 10/596,340  
Amdt. dated September 8, 2008  
Reply to Office Action of March 6, 2008

### **Remarks**

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 27, 31, 33-35, 43-44, 48, and 50-51 have been amended. Claims 28-30, 32, and 49 have been cancelled. No new matter has been entered.

Applicant would like to thank the Examiner for the time spent in a brief telephone interview on September 8, 2006. No exhibits were shown. The objection to the drawings was discussed, as the applicant was confused by the Examiner's use of the phrase "conic section" which does not appear in the claims. The Examiner indicated that the objection was directed to claim 49. As a result, claim 49 has now been cancelled from the claims. The objection is now believed moot, and withdrawal of the objection is requested.

Regarding item number (1), the applicant appreciates the Examiner's acknowledgement of the claim for foreign priority. The applicant is in the process of obtaining a copy of the French priority document, and will transmit a certified copy in due course.

Regarding item number (2), the Examiner's statement is somewhat confusing and non-specific regarding the Information Disclosure Statement. It is assumed that the Examiner is referring to the Zare et al. reference (U.S. 4,675,300) that was cited in an Information Disclosure Statement filed by our office on August 8, 2006 for the instant application, but not considered by the Examiner. As a result, a Supplemental Information Disclosure Statement is filed concurrently with this response to correct the patent date of Zare et al. from 08-01-2006 to 06-23-1987. Accordingly, consideration of the Zare et al. reference and withdrawal of the objection are respectfully requested. If there are any further objections to the Information Disclosure

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Statement, the Examiner is requested to provide sufficient detail for any such objections so that the applicant may better address them.

Regarding item number (3), the Examiner's statement is somewhat confusing and non-specific regarding the Declaration. However, the applicant is in the process of obtaining a new, fully typewritten copy of Declaration, and will transmit it in due course.

Regarding item number (4), as discussed above, the Examiner indicated that the drawings were objected to with regards to claim 49. As a result, claim 49 has now been cancelled from the claims, and the objection is now believed moot. Accordingly, the drawings are believed to be in condition for allowance, and withdrawal of the objection is requested.

Regarding item number (5), per the Examiner's suggestion, the abstract has been amended to remove the phrase "The invention relates to an." Additionally, various other minor changes have been made to make the abstract more clear and concise. Accordingly, withdrawal of the objection is requested.

Regarding item numbers (6)-(7), claims 31, 34, 35, 48, 49, 50, 51, and 52 were variously rejected under 35 USC 112. As a result, each of claims 31, 34, 35, 48, 50, 51, and 52, and also claim 43, have been amended appropriately to overcome the individual rejections thereto. Accordingly, claims 31, 34, 35, 43, 48, 50, 51, and 52 are now believed to be in condition for allowance, and withdrawal of the rejections is respectfully requested.

Regarding item numbers (8)-(9), claims 27-29, 31, 36, 45, and 48-50 were variously rejected under 35 USC 102(b) by Salzman et al. (U.S. 3,946,239). Amended claim 27 now states, in pertinent part, "wherein the means used to present said medium are capable of making the medium circulate along a path passing through the first focus," and "wherein the angle between the path of the means used to circulate the medium and the path of the means used to transport an excitation beam is less than 90° at the first focus," and "wherein the means used to circulate the medium include a transparent tube, at least at the first focus." Salzman et al. does not disclose such structure.

As an initial matter, the Examiner admits on page 7 of the Office action (see item number (12)) that Salzman et al. does not disclose a non-orthogonal relationship between the two paths. Indeed, Salzman et al. only discloses an orthogonal relationship in the drawings, and makes no other mention of any such relationship in the specification.

Moreover, also on page 7, the Examiner further admits that Salzman et al. does not disclose usage of a tube, or more specifically a transparent tube, to circulate the medium through the first focus 20. Indeed, Salzman et al. merely describes that “Cells pass through a sample inlet tube 24 and mix with a sheathing fluid passed through a sheath inlet tube 26 in an area 28 of a nozzle 30. The sheathed cells then pass through nozzle 30 so that they flow through primary focus 20. After the liquid sheathed cells go through focus 20 they outlet through an outlet device 32,” and additionally that “The ellipsoidal flow chamber is preferably filled with water or another desirable liquid medium through conduit 54 in block 12.” See column 3, lines 8-14 and 19-21.

Conversely, in the instant application, the angle between the path of the means used to circulate the medium and the path of the means used to transport an excitation beam can be less than 90 degrees at the first focus. See page 3, line 31 through page 4, line 3. Additionally, the means used to circulate the medium may include a transparent tube, at least at the first focus. See page 4, lines 9-10. A medium (liquid or gas) to be analysed will pass through the hole 4, the fluid being transported inside the transparent tube. See page 7, lines 18-20.

Thus, for example, the axis of the hole 3 and the axis of the hole 4 may then make an angle between them such that reflections of light emitted by the fluid and that reach the transparent material of the tube 7 are concentrated at a particular location. See page 8, line 25 through page 9, line 7.

This is important because when a light beam lights a tube realized in a transparent material, the tube acts as a cylindrical lens. When the light beam has a diameter similar to the diameter of the outer diameter of the tube, the tube spreads the incident light in a plane orthogonal to the axis of the tube. Depending on the inner and outer diameters of the tube, an

explosion of the light beam incident to the tube can happen. This is the case with tubes usually used with laser beams that are called capillaries.

As a result, the inventors of the present invention have discovered that the explosion phenomenon of a light beam incident to this kind of tube may depend upon the angle of attack of the light beam with respect to the capillary. For example, an angle of attack of less than 90 degrees can increase the results of such an explosion phenomenon. See page 8, line 25 through page 9, line 7.

Therefore, for the reasons stated herein and by the Examiner's own admission, Salzman et al. does not disclose each and every limitation of amended claim 27, as is required by law to support a rejection under 35 USC 102(b). Specifically, Salzman et al. does not disclose "wherein the means used to present said medium are capable of making the medium circulate along a path passing through the first focus," or "wherein the angle between the path of the means used to circulate the medium and the path of the means used to transport an excitation beam is less than 90° at the first focus," or "wherein the means used to circulate the medium include a transparent tube, at least at the first focus." Accordingly, it is respectfully submitted that amended claim 27 is now in condition for allowance. Similarly, because claims 31, 33-48, and 50-52 are dependent upon amended claim 27, it is submitted that claims 31, 33-48, and 50-52 are also in condition for allowance. Withdrawal of the rejections is respectfully requested.

Regarding item numbers (10)-(12), claims 30, 32-34, 44, 37, 38, 46, 47, 52, and 51 were variously rejected under 35 USC 103(a) as being unpatentable over Salzman et al. (U.S. 3,946,239). As discussed above, independent claim 27 has been amended, and each of claims 33-34, 44, 37, 38, 46, 47, 52, and 51 is directly or indirectly dependent thereon. Claims 30 and 32 have been cancelled. Thus, for the reasons discussed above, it is respectfully submitted that the noted rejections are now moot.

Additionally, amended claim 27 now states, in pertinent part, "wherein the means used to present said medium are capable of making the medium circulate along a path passing through the first focus," and "wherein the angle between the path of the means used to circulate the

medium and the path of the means used to transport an excitation beam is less than 90° at the first focus,” and “wherein the means used to circulate the medium include a transparent tube, at least at the first focus.” For the reasons discussed previously herein, Salzman et al. does not teach, disclose, or suggest such structure.

In distinction, the inventors of the present invention have discovered new and unexpected results that are non-obvious and of statistical and practical significance with respect to the explosion phenomenon of a light beam incident to the kind of capillary tube described in the present application. See MPEP 716.02 *et seq.*

Specifically, in the present application, when the light beam has a diameter similar to the diameter of the outer diameter of the tube, the tube spreads the incident light in a plane orthogonal to the axis of the tube. Depending on the inner and outer diameters of the tube, an explosion of the light beam incident to the tube can happen and may depend upon the angle of attack of the light beam with respect to the capillary. For example, an angle of attack of less than 90 degrees, or even less than about 30 degrees, can increase the results of such an explosion phenomenon. Therefore, a desired amount of the explosion, such as for fine-tuning purposes of the reflected signal or the like, can be controlled based upon the angle of attack. See page 8, line 25 through page 9, line 7.

Conversely, Salzman et al. merely describes that the flow chamber is filled with “water or another desirable liquid medium,” and that the cells to be studied “are sheathed by a fluid medium, which preferably is the same fluid that fills the cavity.” See column 3, lines 19-22 and column 4, lines 7-10, respectively. As a result, because the flow chamber fluid and the sheathing fluid are the same (e.g., water), it is not possible for the explosion phenomenon to result.

As a result, the usage of the transparent tube provides new and unexpected results that are non-obvious such that the signal-to-noise ratio of the signal reflected from the first focus to the second focus can be dramatically increased over the prior art of record due to the explosion phenomenon. Moreover, usage of the transparent tube provides the new ability to fine-tune the signal reflected from the first focal point.

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Therefore, for the reasons stated herein, Salzman et al. does not teach, disclose, or suggest each and every limitation of claims 33-34, 44, 37, 38, 46, 47, 52, and 51, as is required by law to support a rejection under 35 USC 103(a). Specifically, Salzman et al. does not teach, disclose, or suggest all of the limitations of amended independent claim 27, from which each of the noted claims is dependent. Moreover, each of claims 33-34, 44, 37, 38, 46, 47, 52, and 51 are non-obvious in view of Salzman et al. because of the new and unexpected results. Accordingly, it is respectfully submitted that each of claims 33-34, 44, 37, 38, 46, 47, 52, and 51 is now in condition for allowance. Withdrawal of the rejections is requested.

Regarding item numbers (13), claims 39-43 were variously rejected under 35 USC 103(a) as being unpatentable over Salzman et al. (U.S. 3,946,239) in view of Sapp et al. (U.S. 5,430,541). As discussed above, independent claim 27 has been amended, and each of claims 39-43 is directly or indirectly dependent thereon. Neither, Salzman et al. nor Sapp et al. teach, disclose, or suggest such structure. Indeed, Sapp et al. does not provide any disclosure that makes up for the noted deficiencies of Salzman et al., as discussed variously herein. Thus, for the reasons discussed above, it is respectfully submitted that the noted rejections are now moot. Accordingly, it is respectfully submitted that each of claims 39-43 is now in condition for allowance. Withdrawal of the rejections is requested.

Finally, it is noted that claim 35 was not substantively rejected by the Examiner, but was merely rejected for a informality under 35 USC 112. As noted above, the cited informality has been corrected by an amendment thereto. Accordingly, it is respectfully submitted that claim 35 is now in condition for allowance, and notice that effect is hereby requested.

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If it is determined that the application is not in condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any fees required by this communication, please charge such fees to our Deposit Account No. 16-0820, Order No. BRV-40651.

Respectfully submitted,  
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